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10/017,342	12/13/2001	Robert Hundt	10019982-1	6805

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HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER	
MITCHELL, JASON D	
ART UNIT	PAPER NUMBER
2193	

DATE MAILED: 09/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/017,342	HUNDT ET AL.	
	Examiner	Art Unit	
	Jason Mitchell	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This action is in response to remarks filed 7/11/06.

At Applicant's request, claims 1, 6 and 11 have been amended. Claims 1-15 are pending.

Response to Arguments

As an initial matter, Examiner notes the clerical error pointed out by applicant (see the bottom of pg. 9 of the response). This error has been corrected in this action.

Applicant's amendments to claims 1, 6 and 11 are sufficient to overcome the 35 USC 112 2nd rejection to the claims. Accordingly the rejections are withdrawn.

Applicant's arguments filed 7/11/06 regarding the prior art rejection of the claims have been fully considered but they are not persuasive.

In the last full paragraph on pg. 8, Applicant states:

> The Office Action states, "Further, Benitez does not explicitly disclose receiving a child process having inherited an instrumented parent process' context but does disclose receiving new process ... However, Benitez states at Col. 23 lines 19-20 "Arc designator 520 creates a record in table 222 for each such target block, if a record does not already exist" ... Benitez's target block isn't a process. Benitez's target block is a sequence of instructions that may potentially be identified as a hot block.

Respectfully, it is noted that above and beyond any explicit disclosure of 'receiving a new process' such functionality is inherent in the nature of Benitez's system. For

example, initially, Benitez must receive a new process upon which to operate, otherwise the system would never be able to perform its intended function.

In the first full paragraph on pg. 9, Applicant states:

> Since Benitez teaches removing translated hot blocks from memory, Benitez cannot teach "provided an instruction pointer resides in said instrumented code space, updating said instruction pointer to point to said uninstrumented code space," as claim 1 recites.

Examiner respectfully disagrees. Removing a 'hot trace' that has 'gone cold' from memory would leave pointers in other 'hot traces' (instrumented code space) which would, after such a removal, but pointing to 'unmapped' instructions in the removed 'hot trace'. It is these instruction pointers residing in instrumented code space which Benitez updates to point to said uninstrumented code space (see Benitez col. 29, lines 19-24 "address of a translated instruction ... is replaced with the address of the corresponding original instruction").

For example, see Applicant's description of Benitez in the first full paragraph of pg. 8 of the instant response.

> Now assume for the sake of illustrating Benitez that the first translated hot block is identified as "cold" and therefore the first portion of original code will be executed instead of the first translated hot block. In this case, the target address specified by the jump instruction in the second translated hot block will need to be changed back. Benitez discussed using the backpatcher at Col. 29, lines 19-24 to correct the target address specified by the jump instruction.

It is the 'correct[ion] of the target address specified by the jump instruction' which anticipates the discussed limitation.

In the first paragraph on pg. 10 Applicant states:

> Applicants respectfully point out that Claim 1 does not recite, "means of returning control to the uninstrumented child." Claim 1 does recite "executing said child process and, provided said child process generates a fault by seeking to access an address in said instrumented code space which is inaccessible due to being unmapped, providing an address in said uninstrumented code space that corresponds to said address in said instrumented code."

Respectfully, the limitation Examiner is addressing here is the claimed 'generates a fault by seeking to access an address in said instrumented code space'. Benitez discloses a situation where "cold trace detector and remover 1220 [has] not been invoked" leaving jumps to the newly 'cold' trace (i.e. the process seeks to access an address in said unmapped code space). In this case control must be returned to instruction fetcher 430 (see col. 37, lines 16-18). It is Examiner assertion that It would have been obvious use a 'fault' to indicate this situation (access to an address in unmapped code space) so that control could be returned, thus "generating a fault by seeking to access an address in said ... code space which is ... unmapped" as claimed.

In the second to last full paragraph on pg. 10, Applicant states:

> The Office Action asserts that the Unix reference teaches "a child process having ..." However, clearly the Unix reference does not teach "receiving a child process..."

Respectfully, the creation of a child process (Unix pg. 1, "The fork () function is used to create a new process") necessarily requires functionality for receiving the newly created process. Otherwise the process would be lost and the creation process would be useless.

In the last full paragraph on pg. 10 Applicant states:

> The Office Action goes onto state, "The fork() function is used to create a new process from an existing process')." However, this still does not reach the limitation of "a child process having inherited an instrumented parent process' context including the parent's program text that may have been modified by instrumentation resulting in an instrumented code space."

Examiner respectfully disagrees. The Unix reference teaches that a 'child process' inherits its parents 'environment' (see the second bullet point at the bottom of pg. 1). It is Examiners assertion that a parent processes 'environment' would obviously include its 'Hot' or 'Cold' status. Further it is noted that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In view of the above discussion, the rejections of claims 1-15 are maintained.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 6 and 11 recite the limitation "said instrumented code" in the last 2 lines of each claim. There is insufficient antecedent basis for this limitation in the claim. It is noted that there is sufficient antecedent basis for a limitation reciting "said instrumented code space".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,189,141 to Benitez et al. (Benitez) in view of "Unix Programming Frequently Asked Questions – 1. Process Control".

Regarding Claims 1, 6 and 11: Benitez discloses reverting a process in an in-line instrumented state to an uninstrumented state (col. 4, lines 21-22 'removes a hot trace') by modifying selected text segment portions from said process (col. 29, lines 19-24 'a target address of a translated instruction ... is replaced with the address of the corresponding original instruction'); unmapping said instrumented code space such that said instrumented code space is inaccessible to said process (col. 27, lines 49-51 'changes hot block storage management map so that ... coldest blocks are indicated to be available'); provided an instruction pointer resides in said instrumented code space, updating said instruction pointer to point to said uninstrumented code space (col. 29, lines 19-24 'address of a translated instruction ... is replaced with the address of the corresponding original instruction'); and executing said process and, provided said process generates a fault, providing an address in said uninstrumented code space that corresponds to said address in said instrumented code (col. 11, lines 28-38 'an error

condition has been detected ... control is returned to interrupter-preserver ... resuming conventional execution').

Benitez does not explicitly disclose that said process generates the fault by seeking to access an address in instrumented code space, which is inaccessible due to being unmapped. However Benitez does teach that control should be returned to fetcher 430 when a process attempts to access unmapped code space (col. 37, lines 11-18, 'If cold trace detector and remover 1220 had not been invoked, ... time may be spent returning control to instruction fetcher 430'), and It would have been obvious to a person of ordinary skill in the art at the time of the invention to raise a fault (col. 11, lines 28-38 'an error condition has been detected') in this instance as a means of returning control to the uninstrumented code (col. 37, lines 11-18, 'returning control to instruction fetcher 430').

Further, Benitez does not explicitly disclose receiving a child process having inherited an instrumented parent process' context but does disclose receiving new processes (col. 23, lines 19-20 'creates a record in table 222 ... if a record does not already exist'). Unix teaches a child process having inherited an instrumented parent process' context including a parent's program text that may have been modified by instrumentation, resulting in an instrumented code space (pg. 1, 'The fork () function is used to create a new process from an existing process').

It would have been obvious to a person of ordinary skill in the art at the time of the invention to submit any newly created child process to Benitez' 'Cold Block Remover', thus resulting in an uninstrumented code space that is an uninstrumented version of

said instrumented code space (col. 27, lines 49-51), because 'A hot trace is a trace through which control ... has passed more than a predetermined number of times (col. 2, line 41-44).

Regarding Claims 2, 7 and 12: The rejections of claims 1, 6 and 11 are incorporated respectively; further, Benitez discloses said selected text segment portions are selected from the group consisting of: branches, switch tables, procedure lookup tables (PLTs) for said instrumented code space (col. 29, line 20 'backpatches a jump'). Please note that branches, switch tables and PLT's are all considered jumps (col. 2, lines 62-65 'transferring control over an arc ... is referred to as a jump').

Benitez does not explicitly disclose the text segment portions being selected from a group of breakpoints however he does disclose changing instructions that facilitate debugging and monitoring (col. 34, lines 16-20 'such functions as debugging, ... monitoring')

It would have been obvious to a person of ordinary skill in the art at the time of the invention to include text segment portions representing breakpoints in addition to the jump instructions explicitly disclosed in Benitez (col. 29, line 20) because one of ordinary skill in the art would want the ability to provide a more complete translation of the code (col. 34, lines 11- 16 'may instrument, or other wise translate, instructions ... in addition to such instrumentation').

Regarding Claims 3, 8 and 13: The rejections of claims 1, 6 and 11 are incorporated respectively; further, Benitez discloses said instrumented code space is comprised of

shared memory (col. 10, lines 15-16 'instruments hot blocks and stores them in main memory').

Regarding Claims 4, 9 and 14: The rejections of claims 1, 6 and 11 are incorporated respectively; further, Benitez discloses unwinding a call stack of said process and recording return addresses of said process (Fig. 6D).

The hot block-arc table shown in Fig. 6D is a record of jumps the execution has followed. The value in column 222D represents the target address of each jump instruction (col. 28, line 3 'column 222D ... the jump arc target'), and the value of column 222B represents the jump instruction's address (col. 28, lines 22-27 'the "starting hot block address" ... represented by column 212B'). The Backpatcher follows a path retrieved from this table (col. 2, lines 1-3 'determination is made by examining the fields for each record') in order to de-instrument any code that has 'gone cold' (col. 29, lines 21-24 'target address of a translated instruction ... is replaced with the address ... in original instruction storage').

Regarding Claims 5, 10 and 15: The rejections of claims 4, 9 and 14 are incorporated respectively; further Benitez discloses comparing said return addresses of said process to said address in said instrumented code space which generated said fault upon execution of said process (col. 27, lines 63-67 'backpacker searches hot block-arc table to determine if any ... block has a jump instruction that jumps to the block from which translated instructions were translated').

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Mitchell whose telephone number is (571) 272-3728. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (571) 272-3719. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jason Mitchell
8/21/06

KAKALI CHAKI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100